

CLAIMS

1. A monomer, oligomer or polymer of formula I



wherein

A and C denote independently of each other a group of formula II



R^1 is in each occurrence independently of one another H, halogen, or straight chain, branched or cyclic alkyl with 1 to 20 C-atoms, which is unsubstituted, mono- or poly-substituted by F, Cl, Br, I or CN, wherein one or more non-adjacent CH_2 groups are optionally replaced, in each case independently from one another, by -O-, -S-, -NH-, -NR⁰-, -SiR⁰R⁰⁰-, -CO-, -COO-, -OCO-, -OCO-O-, -SO₂-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a manner that O and/or S atoms are not linked directly to one another, or R^1 denotes optionally substituted aryl or heteroaryl or P-Sp-,

R^2 has one of the meanings of R^1 or denotes -C≡C- R^3 ,

R^3 has one of the meanings of R^1 ,

R^0 and R^{00} are independently of each other H or alkyl with 1 to 12 C-atoms,

P is a polymerizable or reactive group,

Sp is a spacer group or a single bond,

B and D are independently of each other $-CX^1=CX^2-$, $-C\equiv C-$, or optionally substituted arylene or heteroarylene,

X^1 and X^2 are independently of each other H, F, Cl or CN,

a, b, c, d are independently of each other 0 or 1, with $a + b + c + d > 0$, and wherein in at least one recurring unit $[(A)_a-(B)_b-(C)_c-(D)_d]$ at least one of a and c is 1, and

n is an integer ≥ 1 ,

and wherein the recurring units $[(A)_a-(B)_b-(C)_c-(D)_d]$ are identical or different.

2. A monomer, oligomer or polymer according to claim 1, which is of formula II



wherein A, B, C, D, a, b, c, d and n are as defined in formula I,

R^4 and R^5 have independently of each other one of the meanings of R^1 , or denote $B(OR')(OR'')$ or $SnR^0R^{00}R^{000}$,

R^{0-000} are independently of each other H or alkyl with 1 to 12 C-atoms, and

R' and R'' are independently of each other H or alkyl with 1 to 12 C-atoms, or OR' and OR'' together with the boron atom form a cyclic group having 2 to 10 C atoms.

3. A monomer, oligomer or polymer according to claim 1, wherein n is an integer from 1 to 5000.

4. A monomer, oligomer or polymer according to claim 2, wherein n is an integer from 1 to 5000.

5. A monomer, oligomer or polymer according to claim 1, wherein R^1 , R^2 and/or R^3 are selected from C_1 - C_{20} -alkyl that is optionally substituted with one or more fluorine atoms, C_1 - C_{20} -alkenyl, C_1 - C_{20} -alkynyl, C_1 - C_{20} -alkoxy, C_1 - C_{20} -thioether, C_1 - C_{20} -silyl, C_1 - C_{20} -ester, C_1 - C_{20} -amino, C_1 - C_{20} -fluoroalkyl, or optionally substituted aryl or heteroaryl.

6. A monomer, oligomer or polymer according to claim 2, wherein R^1 , R^2 and/or R^3 are selected from C_1 - C_{20} -alkyl that is optionally substituted with one or more fluorine atoms, C_1 - C_{20} -alkenyl, C_1 - C_{20} -alkynyl, C_1 - C_{20} -alkoxy, C_1 - C_{20} -thioether, C_1 - C_{20} -silyl, C_1 - C_{20} -ester, C_1 - C_{20} -amino, C_1 - C_{20} -fluoroalkyl, or optionally substituted aryl or heteroaryl.

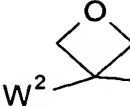
7. A monomer, oligomer or polymer according to claim 5, wherein R^2 is $-C\equiv C-R^3$ and R^1 and R^3 are identical groups as defined in formula I.

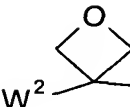
8. A monomer, oligomer or polymer according to claim 6, wherein R^2 is $-C\equiv C-R^3$ and R^1 and R^3 are identical groups as defined in formula I.

9. A monomer, oligomer or polymer according to claim 2, wherein n is an integer from 1 to 15 and one or both of R^4 and R^5 denote P-Sp-.

10. An oligomer or polymer according to claim 1, wherein n is an integer from 2 to 5000.

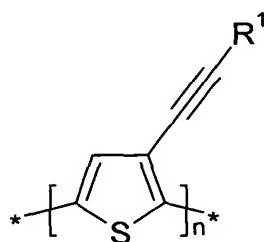
11. An oligomer or polymer according to claim 2, wherein n is an integer from 2 to 5000.

12. A monomer, oligomer or polymer according to claim 1, having at least one P-Sp- group wherein P is selected from $\text{CH}_2=\text{CW}^1\text{-COO-}$, $\text{W}^2\text{HC} \begin{array}{c} \diagup \text{O} \diagdown \\ \text{---} \end{array} \text{CH-}$,  $(\text{CH}_2)_{k1}\text{-O-}$, $\text{CH}_2=\text{CW}^2\text{-(O)}_{k1}\text{-}$, $\text{CH}_3\text{-CH=CH-O-}$, $(\text{CH}_2=\text{CH})_2\text{CH-OCO-}$, $(\text{CH}_2=\text{CH-CH}_2)_2\text{CH-OCO-}$, $(\text{CH}_2=\text{CH})_2\text{CH-O-}$, $(\text{CH}_2=\text{CH-CH}_2)_2\text{N-}$, $\text{HO-CW}^2\text{W}^3\text{-}$, $\text{HS-CW}^2\text{W}^3\text{-}$, $\text{HW}^2\text{N-}$, $\text{HO-CW}^2\text{W}^3\text{-NH-}$, $\text{CH}_2=\text{CW}^1\text{-CO-NH-}$, $\text{CH}_2=\text{CH-(COO)}_{k1}\text{-Phe-(O)}_{k2}\text{-}$, Phe-CH=CH- , HOOC- , OCN- , and $\text{W}^4\text{W}^5\text{W}^6\text{Si-}$, with W^1 being H, Cl, CN, phenyl or alkyl with 1 to 5 C-atoms, W^2 and W^3 being independently of each other H or alkyl with 1 to 5 C-atoms, W^4 , W^5 and W^6 being independently of each other Cl, oxaalkyl or oxacarbonylalkyl with 1 to 5 C-atoms, Phe being 1,4-phenylene and k_1 and k_2 being independently of each other 0 or 1.

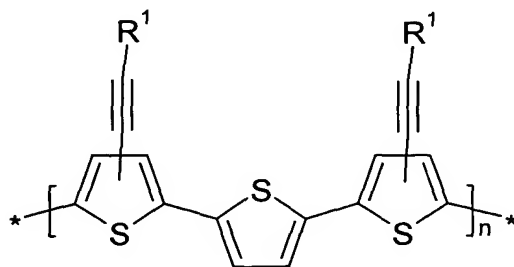
13. A monomer, oligomer or polymer according to claim 2, having at least one P-Sp- group wherein P is selected from $\text{CH}_2=\text{CW}^1\text{-COO-}$, $\text{W}^2\text{HC} \begin{array}{c} \diagup \text{O} \diagdown \\ \text{---} \end{array} \text{CH-}$,  $(\text{CH}_2)_{k1}\text{-O-}$, $\text{CH}_2=\text{CW}^2\text{-(O)}_{k1}\text{-}$, $\text{CH}_3\text{-CH=CH-O-}$, $(\text{CH}_2=\text{CH})_2\text{CH-OCO-}$, $(\text{CH}_2=\text{CH-CH}_2)_2\text{CH-OCO-}$, $(\text{CH}_2=\text{CH})_2\text{CH-O-}$, $(\text{CH}_2=\text{CH-CH}_2)_2\text{N-}$, $\text{HO-CW}^2\text{W}^3\text{-}$, $\text{HS-CW}^2\text{W}^3\text{-}$, $\text{HW}^2\text{N-}$, $\text{HO-CW}^2\text{W}^3\text{-NH-}$, $\text{CH}_2=\text{CW}^1\text{-CO-NH-}$, $\text{CH}_2=\text{CH-(COO)}_{k1}\text{-Phe-}$

$(O)_{k_2}$ -, Phe-CH=CH-, HOOC-, OCN-, and $W^4W^5W^6Si$ -, with W^1 being H, Cl, CN, phenyl or alkyl with 1 to 5 C-atoms, W^2 and W^3 being independently of each other H or alkyl with 1 to 5 C-atoms, W^4 , W^5 and W^6 being independently of each other Cl, oxaalkyl or oxacarbonylalkyl with 1 to 5 C-atoms, Phe being 1,4-phenylene and k_1 and k_2 being independently of each other 0 or 1.

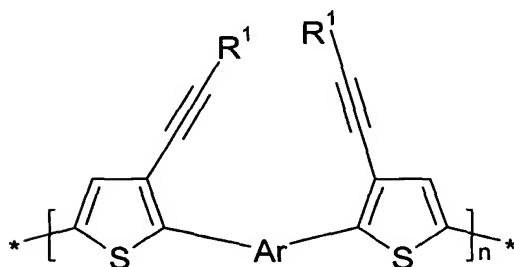
14. A monomer, oligomer or polymer according to claim 1, wherein $-(A)_a(B)_b(C)_c(D)_d$ is selected from the following formulae



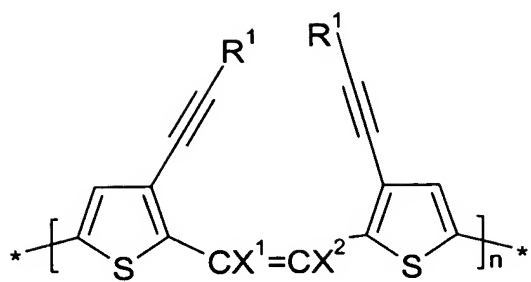
Ia



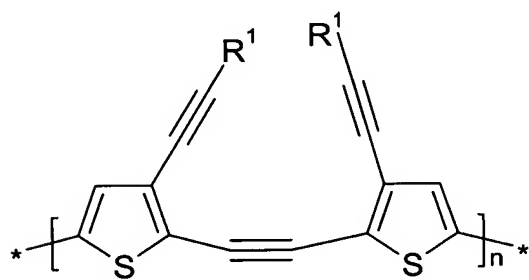
Ib



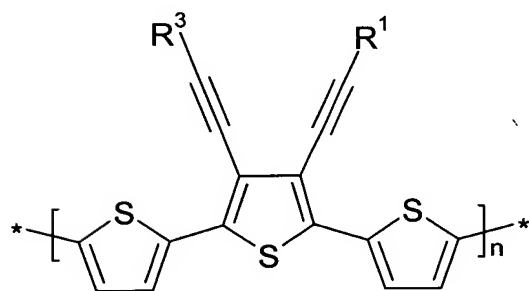
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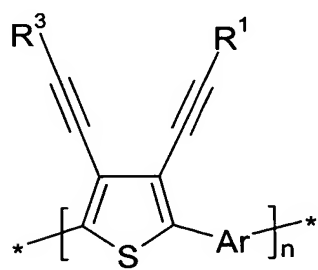
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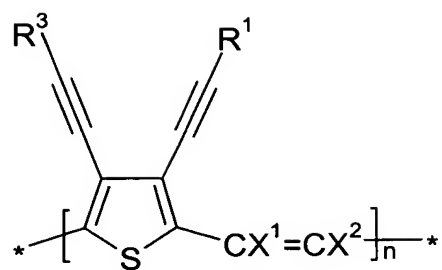
Ie



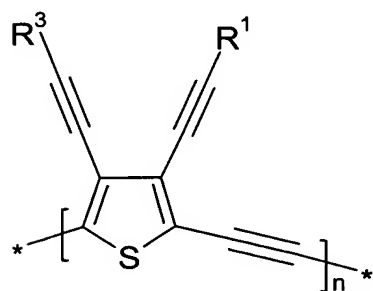
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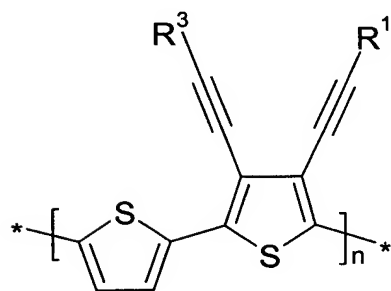
Ig



Ih



Ii



Ik

wherein R^1 , R^3 , X^1 and X^2 have the meanings given in formula I, Ar is arylene or heteroarylene which in each case is optionally substituted by one or more groups R^1 as defined in formula I, and n is an integer from 1 to 5000.

15. A polymer according to claim 1, wherein the polymer has a regioregularity of from 90 to 100%.

16. A polymerizable liquid crystal material comprising one or more monomers, oligomers or polymers of claim 1 comprising at least one polymerizable group, and optionally comprising one or more further polymerizable compounds, wherein at least one of the monomers, oligomers or polymers comprising at least one polymerizable group and/or the further polymerizable compounds is mesogenic or liquid crystalline.

17. An anisotropic polymer film with charge transport properties obtained from a polymerizable liquid crystal material according to claim 11 that is aligned in its liquid crystal phase into macroscopically uniform orientation and polymerised or crosslinked to fix the oriented state.

18. A side chain liquid crystal polymer obtained by polymerisation of one or more monomers or oligomers or polymers according to claim 1 having a polymerizable group or by grafting one or more monomers or oligomers or polymers according to claim 1 to a polymer backbone in a polymeranalogous reaction, optionally with one or more additional mesogenic or non-mesogenic comonomers.

19. A semiconductor or charge transport material, comprising a monomer, oligomer or polymer of claim 1.

20. An optical, electrooptical or electronic device containing a material of claim 19.

21. The device of claim 20 which is a component of integrated circuitry, a field effect transistor (FET), a thin film transistor in a flat panel display, a Radio Frequency Identification (RFID) tag, a semiconducting component for an organic light emitting diode (OLED), an electroluminescent display or backlight of a liquid crystal display, a photovoltaic or sensor device, an electrode material in a battery, a photoconductor or a device for electrophotographic recording.

22. A field effect transistor comprising one or more monomers, oligomers or polymers according to claim 1.

23. A field effect transistor of claim 22, which is a component of integrated circuitry, a thin film transistor in a flat panel display, or a Radio Frequency Identification (RFID) tag.

24. A security marking or device comprising comprising one or more monomers, oligomers or polymers, of claim 1.

25. A security marking or device of claim 24, which comprises a field effect transistor or Radio Frequency Identification tag.

26. A monomer, oligomer or polymer according to claim 1, which is oxidatively or reductively doped to form a conducting ionic species.

27. A charge injection layer, planarizing layer, antistatic film or conducting substrate or pattern for electronic applications or flat panel displays, comprising a conducting ionic species according to claim 26.